$1.95

Making Homemade Wine

By Robert Cluett

Garden Way Publishing Bulletin A-75

Illustrations by Sue Storey

ABOUT THE AUTHOR

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STOREY COMMUNICATIONS, INCORPORATED

GARDEN WAY PUBLISHING
POWNAL, VERMONT 05261

Printed in the United States

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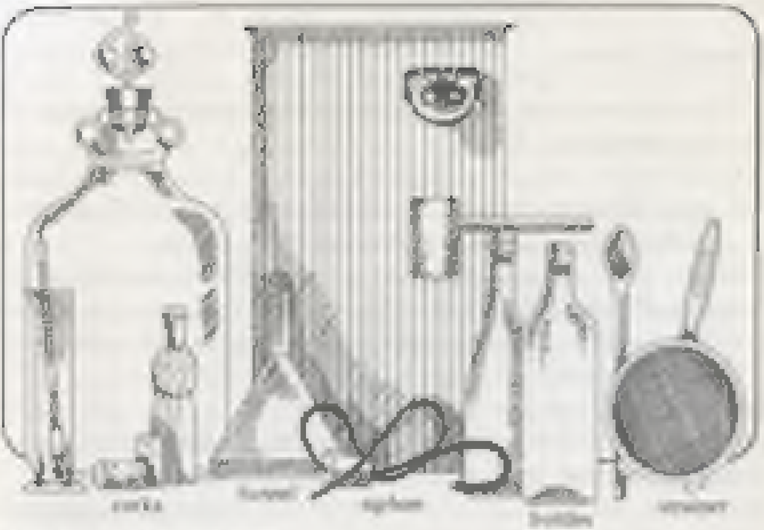
by Robert Cluett

Wine is probably the most ancient and widespread alcoholic drink. It has been around at least several thousand years, as the literature of both the ancient Greeks and Hebrews tells us. Today, alcohol is available in a wide variety of forms: wines, beers, and distilled spirits. But it is wine that is the most popular with home brewers.

Wine is the easiest alcohol to make. It does not require the fastidious temperature control involved in brewing beer. Unlike distilled spirits, it requires no still and does not invite the curiosity of the revenue agents — unless you undertake to sell the wine you produce, and we do not recommend doing that. You can make fine wines from grapes or other fruits, or you can make it from vegetables, grains, or flowers.

This bulletin will take the mystery out of making wine. We will teach you the language of winemakers and explain what ingredients and equipment are essential to the process. We will offer some reliable and delicious wine recipes, and we will tell you the cure and prevention of 13 common problems — in case anything goes wrong with your wine. But we don't expect anything to go wrong. So, enjoy!

As with any specialty, winemaking has a language all its own. Before we go any further, let me introduce you to some of the terms you will come across in the text.



Basic winemaking equipment

De-stemmer: For taking stems off fresh grapes. A large wooden spaghetti server makes an adequate substitute.

Filter and pump: These are used as a last-ditch method of clarification. I have used one once in 250 batches of homemade wine.

Gallon jugs: These are useful in the stage between carboy and bottle. Sometimes restaurants give them away.

Vinometer: Measures alcohol in wines that are fermented out and dry; it is not useful for wines with residual sugar in them.

Wine press: Device for pressing fruit either before or at the end of the first fermentation in the vat. It is necessary if you are making over 100 gallons a year of fresh grape or fresh fruit wine.

Ingredients

Listed below are the ingredients you will need, in addition to fruit, to make wine at home.

Essential Ingredients — Long Shelf-Lives

Acid blend: Raises acidity level of low-acid must and flabby finished wine.

Campden Tablets: Disinfects fresh must and wines during racking.
Disinfectant: Solution of water and potassium metabisulfite crystals, kept in gallon jug. Absolutely essential for cleanliness.
Grape tannin powder: Enhances the flavor and gutsiness of cider, perry, and wines made from concentrates.

Essential — But Perishable — Ingredients

Pectic enzymes: Removes the pectic haze from fruit wines and is put into the must just before yeast. It has a 3-month shelf life.
Yeast culture, liquid or powdered: Essential to fermentation, the yeast organisms turn sugar to alcohol. It has a one-year shelf life if kept unopened in the original sealed jar or packet.

Optional Ingredients

Finings: A powder used to remove microscopic particles that cloud wine.
Glycerine: Adds finish to table wines.
Oak chips: For adding barrel taste, especially to red wines.
Pure unflavored grain or grape alcohol: Fortifies port, sherry, and Madeira.
Sorbic acid (potassium sorbate): Stabilizes the wine before bottling.
Vitamin C tablets, 250 mg: Protects white wines from oxidation.

Basic Techniques of Winemaking

There are only 4 requirements for successful winemaking.

- *The weight or sugar content should be enough to read 1.060 to 1.080 on a hydrometer scale.* (All hydrometer readings in this book are given in the form of *specific gravity* (SG), that is, a fraction of the weight of water.)
- *The acidity of your must should measure .55 to .80 percent to prevent early deterioration.* Obtain this reading with your titration kit.
- *Proper temperatures must be maintained.* During the first 10 days of fermentation, the temperature of the must should measure

- If fruit pulp sticks to your gear, use a plastic abrasive pad and hot water to remove it.
- When putting away your primary fermenters for a while, rinse with sulfite solution, cover with a plastic sheet, and secure with a tight string.

Preparing the Fruit

After you have removed all the stems and leaves from your washed fruit, it is ready for crushing. You can use a commercially available crusher for this stage, or you can improvise with a large plastic container and wooden mallet. With white grapes, as well as with many tree fruits, press out the vegetable matter in a press, so the must consists of *nothing* but juice. With red grapes, you will ferment first for 5 to 10 days and then go to the press. If you are making no more than 35 or 40 gallons a year, you can use a medium-mesh or fine-mesh nylon bag to get the effect of a pressing. Just crush your fruit in the bag, then squeeze the juice out.

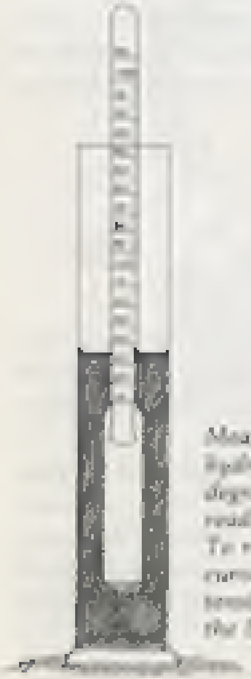
The Garden Way cider press can be used to crush fruit for wine.

Add hot water and other ingredients (see recipe section) to the crushed fruit, and you will have a must, or a liquid that is nearly ready to ferment. Add to the must some Campden Tablets, which will keep it free from debilitating organisms.

Testing the Must

First, test the must with a hydrometer. If the must weight is between 1.080 and 1.095, you won't want to tinker. If it is below 1.080, you will want to add sugar. If it is above 1.095, you will probably want to cut the must somewhat with water, unless you want a very sweet or alcoholic wine. Temperature has a large effect on specific gravity readings, and hydrometers are calibrated to be accurate when the must is at 60 or 68 degrees F.

Next, test the must for acidity with a titration kit. If it is a red must and the acidity is .65 percent, or a white must and the acidity is .75 percent, you will be happy indeed. If your acidity is too low, add an acid blend (citric, malic, or tartaric). With shipped Califor-



Measure specific gravity with a hydrometer. Some hydrometers are calibrated to read accurately at 60 degrees F., others at 68 degrees F. Make sure you are reading your hydrometer at the proper temperature. To read a hydrometer, ignore the way the liquid curves against the stem and tube because of surface tension, and take the reading from the level portion of the liquid.

nia grapes, the natural acidity will be too low. If it's too high (and with Eastern grapes, it may well be), you may want to cut the must somewhat with a sugar and water solution of weight 1.090, or with a dilute low-acidity must made from a hot-climate concentrate (also available from wine-supply stores). Some of my friends ferment their Eastern grapes at a natural acidity of 1.5 percent, but they are patient people: that kind of acidity level makes for either a disagreeable little wine or a long wait — about 5 years (wine loses acidity over time).

You can get to this stage of the process much more quickly and easily by using a grape concentrate from a winemakers' supply store or by using grape juice shipped to a jobber in your nearest urban area. You should not be put off by previous unhappy experiences with concentrates. In the last few years, Wine-Art Ltd. of Toronto, a marketer of home wine products, has been selling concentrates from Australia that make wines indistinguishable from those made with fresh grapes.

Adding the Yeast Culture

The last item of preparation is adding a yeast culture, which should have been mixed with a starter solution 2 to 3 days before the must was crushed or put together. Here is a formula for starting yeast for a 5-gallon batch of wine.

3 ounces frozen orange juice concentrate
24 ounces water
6 ounces sugar
2 rounded teaspoons of ordinary yeast nutrient

Put the frozen orange juice, water, and sugar into a 2-quart saucepan, and bring the mix to a boil on the stove. When the mix boils, remove it from the heat, add the nutrient, and cover the pot until the mix cools to room temperature.

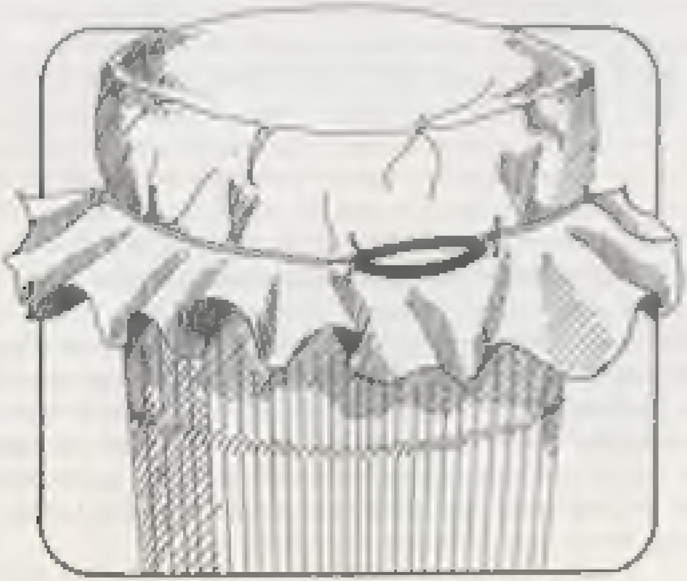
Transfer the starter mix to a sterilized 1-gallon jug, add the yeast culture, and stopper the jug with an air lock. After 24 to 36 hours, "islands" of active yeast should appear on the surface of the liquid. Give the jug a swirl every 6 to 8 hours. When the solution gets to an active ferment (much CO_2 is expelled through the air lock when you swirl), it is ready to add to the must.

Always prestart your yeast for any batch of wine 3 gallons or more. The recipe given above will handle any quantity of wine from 3 to 12 gallons; for larger quantities you will want to double, triple or quadruple the recipe. For smaller quantities, add the yeast culture directly to the must from vial or packet, since the smaller quantities of must will dilute the culture less than larger ones.

Primary Fermentation

After you have adjusted weight and acidity, and added a yeast culture, the vat in which this first (primary) fermentation goes on should be covered with a tight-fitting plastic sheet, fastened with string. Once a vigorous, rolling ferment is started (24 to 48 hours), stir the must and push down the "cap" (the vegetable crust that will form on the top) twice a day. Use a well-sterilized wooden spoon.

Weigh the must every day after the third day, to see how rapidly the fermentation is going. A weight loss of .007 to .015 per day is good; more than that indicates that the must should be moved to a cooler place.



To secure the plastic sheet over the primary fermenter, I have invented an elasticized fastener I call "Chett's String." I take a string that is 4 inches shorter than the circumference of my primary fermenter. Then, I tie the string to a 3-inch rubber band. This makes an easy-to-use string that secures a tight cover over the fermenter.

Test the must frequently with your best piece of winemaker's test equipment — your nose. The smell of a fermenting must is pervasive, at least in the space in which it is fermenting, sometimes throughout the house. If there is an aroma in addition to those of fruit and CO_2 coming from the wine, do not be disturbed unless that aroma has a strong sulphur or vinegar cast to it. In that case, turn to our troubleshooting section, pages 19 to 21.

When the weight reaches 1.025 to 1.030, transfer the wine to glass carboys with a siphon and J-tube. If you are making a red wine, press out the residual fruit left in the fermenting vat. (Here again, the nylon bag is a useful alternative to a press.) Stopper the carboys with air locks filled with sulfite solution to permit CO_2 to escape and prevent air contact with the wine. Leave the wine in the primary fermenter for 5 to 10 days.

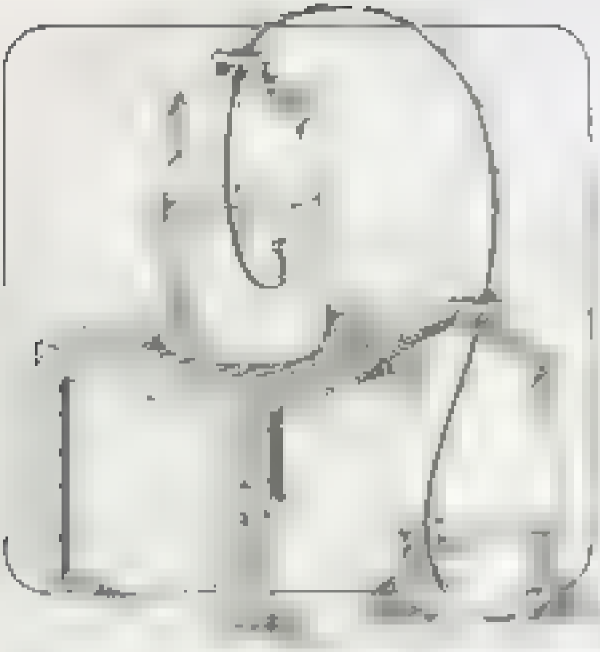
Secondary Fermentation

The next step is to rack the wine into freshly disinfected carboys for the secondary fermentation. To rack wine from a primary to secondary fermenter, place the vessel with the wine in it on a shelf or table at least 30 inches high. Put the sterilized carboy or jug on the floor. Take a 5-foot or 6-foot length of clear tubing with a J-tube on the end, and place the J-tube into the wine, on the bottom of the vessel. Apply suction on the plastic hose to fill it, and put the discharge end quickly into the vessel you are filling. When the wine is completely transferred, rinse and sterilize both the used vessel and the plastic tubing. Change the disinfectant in the air locks.

Until you are very experienced, check the weight of your wine at this point, too. A weight of 1.005 to 1.020 will be average, though a wine that started off very heavy (1.100+) will be fermenting slower at this point because its high alcohol content will inhibit yeast action. A wine with a vigorous yeast in it may well be below 1.000. As long as the wine is sending even the occasional bubble up through the air lock, it is actively fermenting.

Aging

Rack your wine again in another 6 to 12 weeks, adding 1 crushed Campden Tablet per gallon. I prefer a 6-week interval, especially



[illegible]

[illegible] every 6 months.

[illegible] the best way to keep them [illegible]

Fining

At the [illegible] month, perhaps even as soon as [illegible] the hard month [illegible] some [illegible] wines [illegible] you may want [illegible]

Fining, the removal of small particles [illegible] original[illegible] done with bull's blood or egg white [illegible] these [illegible] are mess[illegible] [illegible] use a gelatin [illegible] several [illegible] names [illegible] Sparkalloid.

The [illegible] is [illegible] wine and [illegible] carrying them to the bottom of the carboy. [illegible] work [illegible] the [illegible] fined gunk that has settled to the bottom of the [illegible] can then be [illegible] gallon and put [illegible] age further.

Finishing

Between the seventh and the [illegible] white wine [illegible] there is no [illegible] fermented [illegible] your cellar.

[illegible] fermented [illegible] a weight between [illegible] starting weight [illegible] a starting weight of [illegible] 100 and [illegible] an indication [illegible] fermentation [illegible] .998 which indicates [illegible] residual sugar [illegible] probably [illegible] .998 and then [illegible] weather [illegible] teaspoon of sorbic acid [illegible] the weight of a wine when [illegible]

There is an alternative [illegible] be [illegible] and [illegible] plans such as champagne [illegible] wines get [illegible] teaspoon [illegible] the gallon jug has many advantages [illegible] bottling is just a chore [illegible] mouth stoppered 1 liter carafes that can be kept in the refrigerator. The wine will last nicely for 5 to 6 weeks. A further advantage is that the gallon jug leaves you [illegible]

wine, especially [illegible] home [illegible] wine [illegible] be [illegible] one [illegible] quite [illegible] [illegible] [illegible] [illegible] wine [illegible] [illegible] [illegible] [illegible] keep a few gallons [illegible] [illegible] [illegible] give [illegible] [illegible] [illegible] [illegible] which [illegible] make [illegible] [illegible] each year.

At this point, seven to nine months, you [illegible] packet of oak chips, available from [illegible] wine supply [illegible] your better reds for about a month. This [illegible] and barrel flavor to the wine and [illegible] generally [illegible]. Then remove the chips, rack the wine again.

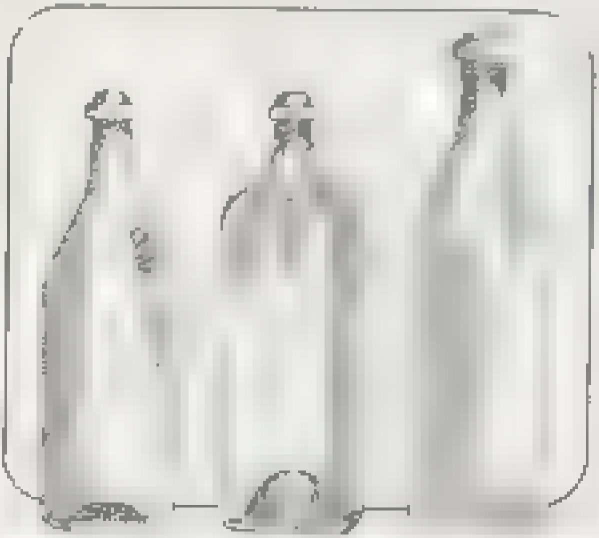
After the oaking, which you may want to [illegible] some wines, taste the wine [illegible] palate. First swirl a bit of wine around in a large wine glass. If it leaves several [illegible] streaks down the [illegible] you have a good [illegible] the wine [illegible] squeeze [illegible] into the [illegible] back of your [illegible] tongue, and then swallow. [illegible] last after swallowing, then you have a [illegible] [illegible] good sign. [illegible] the wine [illegible] or few legs [illegible] quick [illegible] water being [illegible] then added [illegible] [illegible] weeks [illegible] the wine is [illegible] better reds.

Bottling

[illegible] and cork may be [illegible] worth [illegible]

[illegible]

[illegible] has been [illegible]



[illegible] and [illegible] to right: *Burgundy*, [illegible] *Rhine*

[illegible]

[illegible]

[illegible] or breaking glassware

[illegible]

Cellaring

[illegible] Don't give up too soon.

[illegible] have the force of sacred writ

◆ [illegible] go off in flavor

- Store corked bottles on their sides [illegible] upright [illegible] the wine [illegible]
- [illegible] storage temperature [illegible] degrees F [illegible] spans of time. [illegible] degrees F [illegible] oxidize.
- Temperature in a wine storage area should be [illegible] possible. Changes should be gradual. A [illegible] storage area is far preferable to one whose [illegible] degrees F, even though the first one means [illegible] the dangerous [illegible] degree F [illegible] through the [illegible] changes in temperature [illegible] premature aging of the wine [illegible]

[illegible] these guidelines [illegible] a well-made bottle of wine.

Day-to-Day Summary

[illegible] described to this point.

Day	Start your yeast culture
[illegible]	[illegible] and sulfite [illegible]
[illegible]	Break up the cap [illegible] when wine reaches [illegible]
[illegible]	[illegible] press [illegible] sulfite
[illegible]	Rack [illegible]
[illegible]	Rack again [illegible] months thereafter
[illegible]	[illegible] whites [illegible] reds [illegible]
[illegible]	[illegible] reds [illegible]

[illegible] reds may also be ready to serve

[illegible] drink them

[illegible] year 40

[illegible] faster-maturing wine

Troubleshooting

[illegible]

[illegible] has 6 probable causes

- [illegible] temperature carefully

- [illegible] temperature carefully

- [illegible] or sweet or both [illegible]

- [illegible]

[illegible]

- [illegible] often and watch acidity levels

[illegible] your wine

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

- [illegible]

sterilizing

- [illegible]

[illegible]

Recipes

[illegible]

[illegible] begun

[illegible] to the cooled must

[illegible]

[illegible]

CLUETT'S PLONK

This [illegible] 10 weeks

1 unit 100 ounces apricot concentrate
[illegible] white grape concentrate
corn sugar [illegible] per cent [illegible] labels
grape tannin as per labels
yeast nutrient (as per labels)
acid blend [illegible]
warm water as per labels
yeast culture
pectic enzyme (as per labels)

Mix all the ingredients except the [illegible] gallon plastic pail. The water temperature [illegible] degrees F. Cover the pail with [illegible] that the pail is in a place that is room temperature [illegible] for 24 hours. Then measure the [illegible] Add water [illegible] Measure acid and adjust [illegible] 0.60 per cent [illegible] blend [illegible] When the acid and SG levels are [illegible] culture and pectic enzyme.

[illegible] days after fermentation [illegible] This wine, with its high [illegible] very vulnerable [illegible] That's bad news, but one does not get [illegible] without paying a price.

This recipe makes 2 [illegible] gallons [illegible] month's drinking.

FLOWER WINE

[illegible] before bottling.

2 quarts flowers (dandelion heads, [illegible] blossoms
4 pounds raisins, chopped
Juice and peel of [illegible] oranges
Juice and peel of [illegible] lemons
3 pounds sugar
[illegible] acid blend
[illegible] teaspoon grape tannin
1 gallon boiling water
yeast culture

[illegible]

APRICOT OR PEACH WINE

5 pounds apricots or peaches
1 gallon boiling water
2-1/4 pounds sugar
1 tablespoon acid blend
1/2 teaspoon yeast nutrient
1/2 teaspoon pectic enzyme
yeast culture

[illegible]
Add the [illegible] water and acid [illegible]

[illegible]

[illegible]

[illegible] but still do not taste quite up to snuff

[illegible] with crown cap tops and a capper

- [illegible] gallon [illegible] wine [illegible] stabilized with [illegible]
- water
- acid blend
- 10 ounces sugar
- 1 packet dry champagne yeast

[illegible] gallon of water

[illegible] upright

[illegible] test bottle

[illegible]

[illegible] been [illegible] by [illegible] to the Champagne made at [illegible] Another interesting [illegible] together in a gallon jug [illegible] sugar [illegible] in North America [illegible] in Eastern Europe

CIDER OR PERRY

A festive drink of 7 1/2 percent alcohol with a [illegible] for summer parties. To make this recipe [illegible] 6 ounce soda bottles and [illegible] crown caps.

3 pounds apples or pears
2 Campden Tablets
1 gallon boiling water
25 ounces sugar
3 teaspoons acid blend
1 teaspoon yeast nutrient
1/2 teaspoon grape tannin
1/2 teaspoon pectic enzyme
yeast culture

Remove stems [illegible] the fruit [illegible] in a large plastic vessel [illegible] and pour the water over the [illegible]. Tightly cover the vat. After 24 hours [illegible] and press out the fruit. Add the sugar, acid blend [illegible]. Adjust the must [illegible]. Then add the pectic enzyme and yeast [illegible] Cover [illegible] 5 days [illegible] daily. [illegible] transfer the fermenting must [illegible] with a [illegible]

[illegible] measure the [illegible] at 3 days [illegible]. [illegible] transfer the wine [illegible] soda bottles, capping them [illegible] within 2 inches of the cap [illegible] the bottles [illegible]. When the liquid is clear the cider [illegible] ready to drink. When serving, be careful not to disturb the sediment on the bottom of the bottle. This recipe makes [illegible] gallon [illegible]

ELDERBERRY WINE

6 ounces dried or 3 1/2 pounds fresh elderberries
8 ounces raisins, chopped
2 1/2 pounds sugar
4 teaspoons acid blend (optional)
1 teaspoon nutrient
2 Campden tablets
1 gallon hot water
1/2 teaspoon pectic enzyme
yeast culture
vitamin C tablets

[illegible]

[illegible] it comes in contact. Beware

[illegible] gallon. Makes 1 gallon of wine.

POTATO OR CARROT OR PARSNIP WINE

4 1/2 pounds potatoes or carrots or parsnips
peel and juice of 2 oranges
peel and juice of 2 lemons
1 gallon boiling water
2 1/2 pounds sugar
1 teaspoon yeast nutrient
1/2 teaspoon pectic enzyme
1/2 teaspoon grape tannin
yeast culture

Scrub and dice the vegetables, [illegible] the discolored parts. Add the peel [illegible] and

[illegible]

APPLE OR PEAR WINE

8 pounds apples or pears
2 Campden Tablets
1 gallon boiling water
2 pounds sugar
juice of 2 lemons or 4 teaspoons acid blend
1 teaspoon yeast nutrient
1/2 teaspoon pectic enzyme
1/2 teaspoon grape tannin
yeast culture

[illegible] well. Tightly cover the vat.

[illegible]

RASPBERRY OR PLUM WINE

[illegible]

pounds [illegible] day, 1/2 pound on the sixth day

[illegible] pounds [illegible] de-stemmed and de-stoned
2 teaspoons acid blend
2 Campden Tablets
2 pounds sugar
1 gallon warm water (100 degrees F)
1 teaspoon yeast nutrient
1/2 teaspoon grape tannin
1/2 teaspoon pectic enzyme
yeast culture

[illegible]

[illegible]

WHEAT WINE

[illegible] pounds [illegible]

1 pound whole wheat berries
1/2 pound raisins
1 gallon boiling water
peel and juice [illegible] lemon
peel and juice of 2 oranges
2 pounds sugar
1/2 teaspoon acid blend
1/4 teaspoon grape tannin
1/2 teaspoon yeast nutrient
1/4 teaspoon pectic enzyme
yeast culture

Crush the wheat using [illegible] with the chopped raisins in a [illegible]

[illegible] gallon.

UNIVERSAL WINE RECIPE

We offer you here the universal [illegible] E. Anderson [illegible] should take are as follows.

[illegible] preferab[illegible] 350 pounds of grapes.

[illegible]

4. [illegible]

5. [illegible]

6. [illegible] through 18.

[illegible]

FRUIT	WEIGHT OF FRUIT TO YIELD 1 GALLON	PREPARATION OF FRUIT	WATER	ACID BLEND	CAMPDEN TABLETS	YEAST NUTRIENT	SUGAR	RAISINS	PECTIC ENZYME	GRAPE TANNIN	WINE YEAST
Apples	8 lb.	Crush	1 gal.	4 tsp.	2	1 tsp.	2 lb.	None	1/2 tsp.	1/8 tsp.	1 pkt.
Apricots	3 lb.	Destone	1 gal.	3 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/8 tsp.	1 pkt.
Blackberries	4 lb.	Crush	1 gal.	1 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	None	1 pkt.
Blueberries	2 lb.	Crush	1 gal.	3 tsp.	2	1 tsp. energizer	2-1/2 lb.	1 lb.	1/2 tsp.	None	1 pkt.
Sweet cherries	4 lb.	Crush	1 gal.	3 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/4 tsp.	1 pkt.
Sour cherries	3 lb.	Crush	1 gal.	3 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/4 tsp.	1 pkt.
Cranberries	4 lb.	Crush	1 gal.	None	2	1 tsp.	3 lb.	1-1/2 lb.	1/2 tsp.	None	1 pkt.
Concord grapes	6 lb.	Crush	1 gal.	None	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	None	1 pkt.
California grapes	20 lb.	Crush	None	1 tsp.	2	None	None	None	None	None	1 pkt.
Loganberries	2 lb.	Crush	1 gal.	3 tsp.	2	1 tsp.	3 lb.	None	1/2 tsp.	None	1 pkt.
Peaches	3 lb.	Destone	1 gal.	3 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/4 tsp.	1 pkt.
Plums	4 lb.	Destone	1 gal.	3 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/8 tsp.	1 pkt.
Raspberries	3 lb.	Crush	1 gal.	2 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/8 tsp.	1 pkt.
Strawberries	5 lb.	Crush	1 gal.	3 tsp.	2	1 tsp.	2-1/2 lb.	None	1/2 tsp.	1/8 tsp.	1 pkt.

Note: all teaspoon measures in this table are level teaspoons.

Winemaking Suppliers

E. G. Arthurs & Sons, Ltd
2046 Avenue Road
Toronto, Ontario
Canada M5M 4A6

The Complete Winemaker
1201 Main Street
St. Helena, CA 94574

Danenberger
Food Market
P.O. Box 276P
New Berlin, IL 62670

Great Fermentations
87 Larkspur Street
San Rafael, CA 94901

Lundberg's Wine Supplies
9562 Tamarind Avenue
Fontana, CA 92335

Oak Barrel Winecraft
1201 University Avenue
Berkeley, CA 94702

Pierre's Wine Shops
1705 Dollard Ave.
Lasalle, Quebec
Canada H8N 1T7

Semplex of U.S.A.
4805 Lyndale Avenue N.
Minneapolis, MN 55430

Wine and the People
907 University Avenue
Berkeley, CA 94710

Wine-Art Northwest
130–102nd S.E.
Bellevue, WA 98004

Wine-Art of Rochester
1771 Ridge Road East
Rochester, NY 14609

Wine-Art of San Diego
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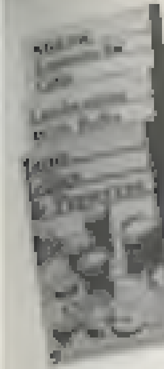

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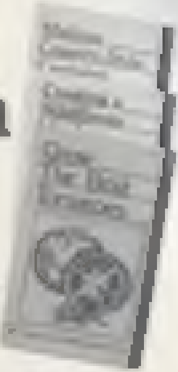

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